10.0 Comparison of Alternatives

This chapter compares the No Build, Existing US 53, M-1, E-1A, and E-2 Alternatives considered for the US 53 project based on the information presented in previous chapters of the Draft Environmental Impact Statement (EIS) and other supporting documents. The comparison also includes the Alternative E-1A RSS Option and Bridge Option, the Alterative E-1A Intersection Option and Interchange Option, the Alternative E-2 Straight Option and Curved Setback Option, and the Alternative E-2 Intersection Option and Interchange Option.

The purpose of this chapter is to compare the benefits and environmental consequences of each alternative against the project's goals and objectives to inform the decision process for the identification of the preferred alternative.

10.1 Comparison Framework

10.1.1 Purpose and Need, Goals, and Objectives

The need for undertaking this project is derived from the following transportation system needs:

- Respond to the roadway easement terms; address the requirements set forth in agreements between the State of Minnesota and the land owner
- Provide a facility that meets regional and inter-regional system connectivity needs and inter-regional highway corridor performance targets
- Maintain local connectivity to the regional system and maintain efficiency of local connections
- Provide a facility that serves current and future capacity needs, while maintaining system mobility and safety

10.1.2 Evaluation Methodology

The evaluation methodology used for this comparison of alternatives is similar to the methods used during the Scoping process (see discussion in Chapter 2: Alternatives). This involved a two-part process, which first compared the alternatives to the project's stated purpose and need goals, and second, compared the environmental impacts among the alternatives. If there is an obvious alternative that clearly meets the stated needs and has fewer/less severe environmental impacts, it is typically identified as the preferred alternative. In the event there are multiple alternatives that meet the project needs, and/or the alternatives have environmental impacts but to different resources, comparison of alternatives and selection of a preferred alternative becomes more complex, requiring additional technical information to be considered in the selection, yet continues to weigh the project needs against the potential environmental impacts of each alternative.

10.2 Comparison Results

10.2.1 Comparison to Project Purpose and Need

The performance of the Draft EIS alternatives were compared based upon the project need criteria listed in Section 10.1.1. The results are reported in Table 10.2-1. It is noted that even though the Existing US 53 Alternative does not technically honor the terms of the easement agreement by not vacating the easement, it provides the mineral rights owner and landowner fair compensation for the land and minerals, which was assumed for purposes of this analysis as an alternate method of meeting the agreement conditions. Additionally, while all of the Build Alternatives technically would meet the project need to honor the requirement to vacate the existing easement agreement area, Alternatives M-1 and

E-1A have high risk for not being able to meet the required May 2017 closure date. Alternative E-2 has the lowest schedule risk based on construction needs.

10.2.2 Summary of Social, Environmental and Economic Impacts

This Draft EIS has described the transportation, social, natural, and physical environmental impacts associated with the construction and operation of the US 53 Virginia to Eveleth project. The effects of the No Build, Existing US 53, M-1, E-1A, and E-2 Alternatives, including options, were evaluated and compared across a range of subject areas related to the built and natural environment. The Existing US 53 Alternative essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized in the following paragraph. A summary of impacts from the other alternatives is provided in Table 10.2-2.

The Existing US 53 Alternative requires the fee acquisition of 77 acres of land to maintain the existing easement agreement area, including mineral rights. The mitigation to the landowner is fair compensation under the Uniform Relocation Act. Encumbering the ferrous resources in this area also requires potential compensation for impacts to the mine operator for lost production. These expenditures would be considered a long-term investment but an irreversible and irretrievable commitment of financial resources. The total capital cost of construction is estimated to be $400-600 million.

Table 10.2-1. Comparison of Alternatives to Project Purpose and Need

Alternative	Need #1: Respond to the existing easement terms	Need #2: Provide a facility that meets regional and inter-regional system connectivity needs and interregional highway corridor (IRC) performance targets	Need #3: Maintain local connectivity to the regional system and maintain efficiency of local connections	Need #4: Provide a facility that serves current and future capacity needs, while maintaining system mobility and safety	Meets all four needs?
No Build	**Yes** – meets requirement to vacate highway	**No** – possible to meet inter-regional target speed and performance but eliminates reasonable constitutional route connections	**No** – eliminates reasonable connection between Gilbert, Eveleth, and Virginia; removes 2nd Ave direct access; adds 21 minutes from Virginia to Gilbert	**No** – does not address short-term and long-term transportation needs	**No, meets 1 of 4**
Existing US 53	**Yes –** only through compensation for continued use of highway	**Yes** – same as the current US 53 corridor	**Yes** – same as the current US 53 corridor	**Yes** – the existing highway would provide sufficient capacity	**Yes**
M-1	**Yes** – meets requirement to vacate highway but unlikely to meet schedule	**Yes** – highway would be designed to support corridor target speed and maintains connectivity between inter-regional destinations	**Yes** – direct route maintains connections with minimal changes to travel time between Gilbert and Virginia	**Yes** – a new 4-lane highway would provide sufficient capacity	**Yes**
E-1A RSS Option[A]	**Yes** – meets requirement to vacate highway but unlikely to meet schedule	**Yes** – highway would be designed to support corridor target speed and maintains connectivity between inter-regional destinations	**Yes** – direct route maintains connections with minimal changes to travel time between Gilbert and Virginia	**Yes** – a new 4-lane highway would provide sufficient capacity	**Yes**
E-1A Bridge Option[A]	**Yes** – meets requirement to vacate highway but unlikely to meet schedule	**Yes** – highway would be designed to support corridor target speed and maintains connectivity between inter-regional destinations	**Yes** – direct route maintains connections with minimal changes to travel time between Gilbert and Virginia	**Yes** – a new 4-lane highway would provide sufficient capacity	**Yes**
E-2[A, B]	**Yes** – meets requirement to vacate highway	**Yes** – highway would be designed to support corridor target speed and maintains connectivity between inter-regional destinations	**Yes** – direct route maintains connections with minimal changes to travel time between Gilbert and Virginia	**Yes** – a new 4-lane highway would provide sufficient capacity	**Yes**

[A] Includes Intersection and Interchange Options; there are no differences in the options with regard to Purpose and Need.

[B] Includes the Straight and Curved Setback Options; there are no differences in the options with regard to Purpose and Need.

Table 10.2-2. Summary of Environmental Impacts (with mitigation)

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page 10-2.

Impact		No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Traffic Volumes		**Impact:** Substantial increase in traffic volumes on designated reroute roadways and local roadways **Mitigation:** None proposed	Daily traffic volumes expected to be similar to the traffic volumes on the easement segment	Daily traffic volumes expected to be similar to the traffic volumes on the easement segment	Daily traffic volumes expected to be similar to the traffic volumes on the easement segment	Daily traffic volumes expected to be similar to the traffic volumes on the easement segment.
Traffic Operations		**Impact:** Four segments would operate at LOS E/F by 2017. Three existing at-grade railroad crossings were not factored into the operations model. **Mitigation:** None proposed	Southern Drive intersection would operate at LOS E/F by 2037 with turning volumes of 400 or 600 vehicles	The 2nd Avenue intersection and the MN 135 intersection/interchange options would operate at acceptable LOS through 2037	The 2nd Avenue intersection and the MN 135 intersection/interchange options would operate at acceptable LOS through 2037	The 2nd Avenue intersection and the MN 135 intersection/interchange options would operate at acceptable LOS through 2037
Travel Times		**Impact:** Increase in travel time doubles between Virginia and Eveleth (+9 minutes), and nearly quadruples (+21 minutes) from Virginia to Gilbert **Mitigation:** None proposed	Negligible change	Negligible change	Negligible change	Negligible change
Safety		**Impact:** Increased safety concerns on reroute roadways due to railroad crossings, increased congestion, and roadways over capacity **Mitigation:** None proposed	No impact	*Intersection Option:* Steeper (6%) grade at the east approach would increase the potential for semi-truck/vehicle conflict at the US 53/MN 135 intersection, increasing crash risk over the Interchange Option *Interchange Option*: Flatter grade (2%) at the east approach would result in a lower crash risk than the Intersection Option	*Intersection Option:* Steeper (6%) grade at the east approach would increase the potential for semi-truck/vehicle conflict at the US 53/MN 135 intersection, increasing crash risk over the Interchange Option *Interchange Option*: Flatter grade (2%) at the east approach would result in a lower crash risk than the Intersection Option	*Intersection Option:* Steeper (6%) grade at the east approach would increase the potential for semi-truck/vehicle conflict at the US 53/MN 135 intersection, increasing crash risk over the Interchange Option *Interchange Option*: Flatter grade (2%) at the east approach would result in a lower crash risk than the Intersection Option
Intermodal	Bicycles and Pedestrians	**Impact**: Trails would continue until landowner removes them **Mitigation:** None proposed; Mesabi Trail would need to be realigned (by others) to a new corridor	**Impact**: Trails would continue until landowner removes them **Mitigation:** None proposed; Mesabi Trail would need to be realigned (by others) to a new corridor	**Impact:** Crosses Mesabi Trail several times **Mitigation**: A permit for the Mesabi Trail could be allowed along the east side of the alignment	**Impact:** Crosses Mesabi Trail several times **Mitigation**: A permit for the Mesabi Trail could be allowed along the east side of the alignment	**Impact:** Crosses Mesabi Trail several times **Mitigation:** A permit for the Mesabi Trail could be allowed along the east side of the alignment
	Bus Transit	**Impact:** Substantially lengthened routes (as noted under Travel Times above) **Mitigation:** None proposed	Negligible change	Negligible change	Negligible change	Negligible change
	Rail	**Impact:** Three existing at-grade rail crossings would be part of the designated US 53 reroute, increasing safety risk to travelers at these crossings **Mitigation:** None proposed	No impact	No impact	No impact	No impact
	Aviation	**Impact:** No direct impacts to the airport; travel time to/from the airport may be increased for some users **Mitigation:** None proposed	No impact	No impact	No impact	No impact
	Other	**Impact:** Adverse impacts to school bus and emergency service routes (see Travel Time) **Mitigation:** None proposed	No impact	No impact	No impact	No impact

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page 10-2.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Right-of-Way	No impact	**Impact:** Right-of-way required from 13 parcels (no relocations) with majority from RGGS property; access modification on up to 3 parcels; up to 132 acres of right-of-way needed Total acquisition of up to 1 parcel **Mitigation**: Compensate landowners via federal Uniform Relocation Act; use constrained cross section where possible to minimize roadway footprint in mine	**Impact:** Right-of-way acquired from 19 parcels (2 relocations) with majority from RGGS and State of Minnesota property; access modification on up to 5 parcels *Intersection Option:* Up to 195 acres of right-of-way needed; total acquisition of up to 4 parcels *Interchange Option:* Up to 197 acres of right-of-way needed; total acquisition of up to 6 parcels **Mitigation**: Compensate landowners via federal Uniform Relocation Act; use constrained cross section where possible to minimize roadway footprint in Rouchleau Pit and on School Trust lands	**Impact:** Right-of-way acquired from 19 parcels (2 relocations) with majority from RGGS and State of Minnesota property; access modification on up to 5 parcels *Intersection Option:* Up to 195 acres of right-of-way needed; total acquisition of up to 4 parcels *Interchange Option:* Up to 197 acres of right-of-way needed; total acquisition of up to 6 parcels **Mitigation**: Compensate landowners via federal Uniform Relocation Act; use constrained cross section where possible to minimize roadway footprint in Rouchleau Pit and on School Trust lands	**Impact:** *Straight Option:* Right-of-way required from 8 parcels (1 relocation) with majority from RGGS and State of Minnesota property; access modification on up to 3 parcels; up to 151 acres with *Intersection Option* and up to 156 acres of right-of-way needed with the *Interchange Option* Total acquisition of up to 3 parcels for both *Intersection and Interchange Options* *Curved Setback Option:* Impacts are the same as for the Straight Option, except 1 additional parcel is impacted **Mitigation**: Compensate landowners via federal Uniform Relocation Act; use constrained cross section where possible to minimize roadway footprint in Rouchleau Pit and on School Trust lands
Economic and Business	**Impact:** Substantial increase (adding 9 to 21 minutes) of travel times between destinations that cross mine; substantial loss of retail sales and local jobs in East Range and Quad Cities; increased community costs for emergency services, school transportation, and general public services **Mitigation:** None proposed	**Impact:** Potential economic impact to mine operations to the extent that the mine operator has raised numerous concerns and opposition to this alternative Moderate conflict with ferrous resources High risk for air quality compliance to impact mine operations **Mitigation**: Use constrained cross section where possible to minimize roadway footprint in mine; provide elevated tunnel to separate receptors on road from PM10 exceedances	**Impact:** No identified local/regional economic impact due to this alignment Minor conflict with ferrous and non-ferrous metallic resources Moderate risk for air quality compliance to impact mine operations **Mitigation**: Use constrained cross section where possible to minimize roadway footprint in permit to mine area with RSS Option; future mine access bridge location identified for mine access under US 53 in RSS Option	**Impact:** No identified local/regional economic impact due to this alignment Minor conflict with ferrous and non-ferrous metallic resources Little risk for air quality compliance to impact mine operations **Mitigation**: Use constrained cross section where possible to minimize roadway footprint in permit to mine area	**Impact:** No identified local/regional economic impact due to this alignment Potential future conflict with ferrous and non-ferrous metallic resources No risk for air quality compliance to impact mine operations **Mitigation**: Use constrained cross section where possible to minimize roadway footprint in resource rich areas

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page 10-2.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Parks/Section 4(f)	**Parkland Impact:** Trails would continue until landowner removes them **Parkland Mitigation:** None required Note: Trails (Mesabi and snowmobile) may be relocated along No Build alignment (by others) **Section 4(f) Impact:** None	**Parkland Impact:** Introduces new crossing of snowmobile trail near Cuyuna Drive. Trails would continue until landowner removes them. **Parkland Mitigation**: Provide safe crossing for trail, as long as trail persists Note: Snowmobile trail to be relocated by others; likely along MN 37 and Co. 7 in conjunction with Mesabi Trail **Section 4(f) Impact:** None	**Parkland Impact:** Introduces new crossings of Mesabi and snowmobile trails. Trails would continue until landowner removes them. **Parkland Mitigation:** Provide safe crossing for trail, as long as trail persists Note: Trail may be relocated along the east side of alignment by permit, if funding is obtained by the SLLCRRA **Section 4(f) Impacts** *Intersection Option*: Negligible impact to OHVRA activities, features or attributes (4.6 acres along west edge; anticipated de minimis Section 4(f) impact) *Interchange Option*: Negligible impact to OHVRA activities, features or attributes (5.1 acres along west edge; anticipated de minimis Section 4(f) impact) **Section 4(f) Mitigation:** OHVRA impacts minimized to extent possible; mitigation measures coordinated by FHWA with the DNR	**Parkland Impact:** Introduces new crossings of Mesabi and snowmobile trails. Trails would continue until landowner removes them. **Parkland Mitigation:** Provide safe crossing for trail, as long as trail persists Note: Trail may be relocated along the east side of alignment by permit, if funding is obtained by the SLLCRRA **Section 4(f) Impacts** *Intersection Option*: Negligible impact to OHVRA activities, features or attributes (4.6 acres along west edge; anticipated de minimis Section 4(f) impact) *Interchange Option*: Negligible impact to OHVRA activities, features or attributes (5.1 acres along west edge; anticipated de minimis Section 4(f) impact) **Section 4(f) Mitigation:** OHVRA impacts minimized to extent possible; mitigation measures coordinated by FHWA with the DNR	**Parkland Impact:** Introduces new crossings of Mesabi and snowmobile trails. Trails would continue until landowner removes them. **Parkland Mitigation**: Provide safe crossing for trail, as long as trail persists Note: Trail may be relocated along the east side of alignment by permit, if funding is obtained by the SLLCRRA **Section 4(f) Impacts** *Intersection Option*: Negligible impact to OHVRA activities, features or attributes (4.3 acres along west edge; anticipated de minimis Section 4(f) impact) *Interchange Option*: Negligible impact to OHVRA activities, features or attributes (4.3 acres along west edge; anticipated de minimis Section 4(f) impact) **Section 4(f) Mitigation:** OHVRA impacts minimized to extent possible; mitigation measures coordinated by FHWA with the DNR
Cultural Resources	No impact	No impact	No impact	No impact	No impact
Land Use	**Impact:** May result in intensified land uses associated with re-route roadways **Mitigation:** None proposed	No impact	No impact	No impact	No impact
Environmental Justice	No disproportionately high or adverse impacts to minority or low income populations	No disproportionately high or adverse impacts to minority or low income populations	No disproportionately high or adverse impacts to minority or low income populations	No disproportionately high or adverse impacts to minority or low income populations	No disproportionately high or adverse impacts to minority or low income populations
Social, Neighborhood, and Community	**Impact:** Substantial impacts to connections among Quad Cities and other localities; necessitates rerouting of school bus routes; emergency response times lengthened **Mitigation:** None proposed	Negligible impact. At-grade intersections at US 53 with 2nd Avenue and MN 135 would increase access to US 53 over what is currently provided by the interchanges at these locations.	Negligible impact At-grade intersection at US 53 with 2nd Avenue would increase access to US 53 over what is currently provided by the existing interchange *Intersection Option:* At-grade intersection at US 53 with MN 135 would increase access to US 53 over what is currently provided by the existing interchange *Interchange Option:* A new interchange at MN 135 may increase access to US 53 compared to the existing interchange	Negligible impact At-grade intersection at US 53 with 2nd Avenue would increase access to US 53 over what is currently provided by the existing interchange *Intersection Option:* At-grade intersection at US 53 with MN 135 would increase access to US 53 over what is currently provided by the existing interchange *Interchange Option:* A new interchange at MN 135 may increase access to US 53 compared to the existing interchange	Negligible impact At-grade intersection at US 53 with 2nd Avenue would increase access to US 53 over what is currently provided by the existing interchange *Intersection Option:* At-grade intersection at US 53 with MN 135 would increase access to US 53 over what is currently provided by the existing interchange *Interchange Option:* A new interchange at MN 135 may increase access to US 53 compared to the existing interchange.

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page 10-2.

Impact		No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Visual and Aesthetics	Natural	**Impact:** Minor beneficial change with views for travelers of more natural/open space	No impact	**Impact:** New views of open space from US 53	**Impact:** New views of open space from US 53	**Impact:** New views of open space from US 53
	Cultural	**Impact:** Minor changes from residential, commercial, mine, and Mineview in the Sky properties	**Impact:** Views of mine and Virginia would be blocked if elevated tunnel is constructed	**Impact**: New view of Rouchleau Pit from US 53	**Impact**: New view of Rouchleau Pit from US 53	**Impact:** Change in views to/from UTAC mine and of Rouchleau Pit
	Highway	**Impact:** Replacement signing for reroute; change from 4-lane divided to 2-lane undivided **Mitigation:** None proposed	**Impact:** Views to and from highway would be blocked if elevated tunnel is constructed **Mitigation**: MnDOT will develop visual quality guidelines for the project and take input from a Visual Quality Review Committee	**Impact:** Views to and from highway would be partially blocked by median and safety barriers; Landfill Road more visible from highway **Mitigation**: MnDOT will develop visual quality guidelines for the project and take input from a Visual Quality Review Committee	**Impact:** Views to and from highway would be partially blocked by median and safety barriers; Landfill Road more visible from highway **Mitigation**: MnDOT will develop visual quality guidelines for the project and take input from a Visual Quality Review Committee	**Impact::** Views to and from highway would be partially blocked by median and safety barriers **Mitigation**: MnDOT will develop visual quality guidelines for the project and take input from a Visual Quality Review Committee
Utilities		**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation:** None proposed	**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation:** MnDOT will coordinate with utility owners to find alternate utility route	**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation**: MnDOT will coordinate with utility owners to find alternate utility route	**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation**: MnDOT will coordinate with utility owners to find alternate utility route	**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation**: MnDOT will coordinate with utility owners to find alternate utility route
Water Supply		No impact	No impact	**Impact:** Alignment within Virginia Inner Emergency Response Area; roadway runoff and spill containment important considerations in design to prevent water quality impacts Potential drawdown of Rouchleau Pit and adjacent Enterprise Pit **Mitigation**: Direct water to ArcelorMittal for mine operations and diversions to Sauntry Creek system from MnDOT dewatering (see Section 5.3), and/or modify ArcelorMittal's appropriation permit; stormwater conveyance/treatment and spill containment provisions; turbidity controls during construction; specifications for the source and nature of any fill material used (i.e., use of clean fill; use of mining by-products only if low in sulfides)	**Impact:** Alignment within Virginia Inner Emergency Response Area; roadway runoff and spill containment important considerations in design to prevent water quality impacts; localized dewatering **Mitigation**: Turbidity controls during construction; stormwater conveyance/treatment and spill containment provisions; specifications for the source and nature of any fill material used (i.e., use of clean fill; use of mining by-products only if low in sulfides)	**Impact:** Alignment within Virginia Inner Emergency Response Area; roadway runoff and spill containment important considerations in design to prevent water quality impacts; localized dewatering **Mitigation**: Turbidity controls during construction; stormwater conveyance/treatment and spill containment provisions; specifications for the source and nature of any fill material used (i.e., use of clean fill; use of mining by-products only if low in sulfides)
Water Body Modification		No impact	No impact	**Impact:** New road crossing of Rouchleau Pit on engineered fill slopes with RSS Option; possible temporary drawdown (up to 30 feet) of Rouchleau Pit during construction; options for dewatering discharge identified **Mitigation**: Standard erosion control/construction BMPs	**Impact:** New bridge crossing over Rouchleau Pit; minor impacts from bridge piers **Mitigation**: Standard erosion control/construction BMPs	**Impact:** New bridge crossing over Rouchleau Pit; minor impacts from bridge piers **Mitigation**: standard erosion control/construction BMPs

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page 10-2.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Wetlands	No impact	**Impact:** Fill/excavation impacts of up to 9 acres of wetland, affecting 7 wetland areas **Mitigation**: Minimum 1:1 replacement wetland credit to be provided via withdrawal of banked credits per state and federal regulations	**Impact:** Fill/excavation impacts of up to 11 acres of wetland, affecting 17 wetland areas; negligible (less than 1 acre) difference between *Intersection and Interchange Options* **Mitigation**: Minimum 1:1 replacement wetland credit to be provided via withdrawal of banked credits per state and federal regulations	**Impact:** Fill/excavation impacts of up to 11 acres of wetland, affecting 17 wetland areas; negligible (less than 1 acre) difference between *Intersection and Interchange Options* **Mitigation**: Minimum 1:1 replacement wetland credit to be provided via withdrawal of banked credits per state and federal regulations	**Impact:** *Straight Option:* Fill/excavation impacts of up to 7 acres of wetland, affecting 15 wetland areas; negligible (less than 1 acre) difference between *Intersection and Interchange Options* *Curved Setback Option:* Potential to impact an additional 2.4 acres of wetland compared to the *Straight Option* **Mitigation**: Minimum 1:1 replacement wetland credit to be provided via withdrawal of banked credits per state and federal regulations
Surface Water/Water Quantity and Quality	**Impact:** 23 acre reduction in impervious area due to road removal **Mitigation**: Implementation of standard BMPs for erosion control and handling taconite containing material during road removal	**Impact:** Net 11 acre reduction in impervious area **Mitigation**: Implementation of stormwater BMPs within project area	**Impact:** Requires pumping system for stormwater collected at fill low point to west side of Rouchleau Pit *Intersection Option:* Net 4 acre reduction in impervious area *Interchange Option:* Net 0.5 acre reduction in impervious area **Mitigation**: Implementation of stormwater BMPs within project area	**Impact:** Gravity drains stormwater to west side of Rouchleau Pit *Intersection Option:* Net 4 acre reduction in impervious area Interchange Option: Net 0.5 acre reduction in impervious area **Mitigation**: Implementation of stormwater BMPs within project area	**Impact:** *Intersection Option:* Net 3 acre reduction in impervious area *Interchange Option:* Net zero reduction in impervious area *Straight and Curved Setback Options* would have essentially the same impacts as noted for the Interchange Option **Mitigation**: Implementation of stormwater BMPs within project area
Geology and Soils/Soil Erosion	No impact	**Impact:** Alignment crosses Biwabik Iron Formation Slope stability and erosion issues associated with fill placement/ bridge(s) in Auburn Pit **Mitigation**: Implementation of erosion control BMPs within project area	**Impact:** Alignment crosses Biwabik Iron Formation Slope stability and erosion issues associated with fill placement in Rouchleau Pit for the RSS fill **Mitigation**: Implementation of erosion control BMPs within project area	**Impact:** Alignment crosses Biwabik Iron Formation Slope stability and erosion issues associated with bridge abutments at edge of Rouchleau Pit **Mitigation**: Implementation of erosion control BMPs within project area	**Impact:** Alignment crosses Biwabik Iron Formation Slope stability and erosion issues associated with bridge abutments at edge of Rouchleau Pit **Mitigation**: Implementation of erosion control BMPs within project area

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page 10-2.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Noise	**Impact:** Substantial noise level increases exceeding state noise standards along existing reroute roadways (MN 37, Co. 7, and Co. 101) **Mitigation:** None proposed	**Impact:** State noise standards would be exceeded at residential locations along the project corridor, specifically at Area D (Ridgewood north), Area E (Ridgewood east), and Area F (Midway) **Mitigation:** A noise wall is preliminarily cost effective at Area F (Midway)	**Impact:** State noise standards would be exceeded at residential locations along the project corridor, specifically at Area C (residential area north of US 53 and east of 2nd Avenue), Area F (Midway), and Area G (Bourgin Road) Noise increase is essentially the same for the Intersection and Interchange Options (less than 1 dBA difference) **Mitigation:** A noise wall is preliminarily cost effective at Area F (Midway)	**Impact:** State noise standards would be exceeded at residential locations along the project corridor, specifically at Area C (residential area north of US 53 and east of 2nd Avenue), Area F (Midway), and Area G (Bourgin Road) Noise increase is essentially the same for the Intersection and Interchange Options (less than 1 dBA difference) **Mitigation:** a noise wall is preliminarily cost effective at Area F (Midway)	**Impact:** *Straight Option:* State noise standards would be exceeded at residential locations along the project corridor, specifically in Area C (residential area north of US 53 and east of 2nd Avenue); noise increase is essentially the same for the Intersection and Interchange Options (less than 1 dBA difference) *Curved Setback Option:* State noise standards would be exceeded at residential locations along the project corridor, specifically in Area C (residential area north of US 53 and east of 2nd Avenue), Area F (Midway), and Area G (Bourgin Road) Noise increase is essentially the same for the Intersection and Interchange Options (less than 1 dBA difference) **Mitigation:** *Straight Option:* A noise wall is preliminarily cost effective at Area C (residential area north of US 53 and east of 2nd Avenue) *Curved Setback Option:* A noise wall is preliminarily cost effective at Area C (residential area north of US 53 and east of 2nd Avenue) and Area F (Midway)
Transportation-Related Air Quality	No impact	No impact	No impact	No impact	No impact
Vegetation and Cover Types	No impact	**Impact:** Converts up to 8 acres of forest and 9 acres of wetland to right-of-way **Mitigation:** See Wetlands	**Impact:** *Intersection Option:* Converts up to 28 acres of forest and 10 acres of wetland to right-of-way *Interchange Option*: Converts up to 33 acres of forest and 11 acres of wetland to right-of-way **Mitigation:** See Wetlands. BMPs for control of weeds and invasive species would be followed near sensitive areas.	**Impact:** *Intersection Option:* Converts up to 28 acres of forest and 10 acres of wetland to right-of-way *Interchange Option*: Converts up to 33 acres of forest and 11 acres of wetland to right-of-way **Mitigation:** See Wetlands. BMPs for control of weeds and invasive species would be followed near sensitive areas.	**Impact:** *Intersection Option (with Straight Option):* Converts up to 33 acres of forest and 7 acres of wetland to right-of-way *Interchange Option (with Straight Option)*: Converts up to 37 acres of forest and 7 acres of wetland to right-of-way *Curved Setback Option:* Converts an additional 10 acres of forest and 2 acres of wetland compared to the Straight Option **Mitigation:** See Wetlands. BMPs for control of weeds and invasive species would be followed near sensitive areas.

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page 10-2.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Fish and Wildlife	No impact	No impact	**Impact:** Negligible to minor impacts **Mitigation**: Peregrine falcon survey to be coordinated with DNR if needed	**Impact:** Negligible to minor impacts **Mitigation**: Peregrine falcon survey to be coordinated with DNR if needed	**Impact:** Negligible to minor impacts **Mitigation**: Peregrine falcon survey to be coordinated with DNR if needed
Threatened & Endangered Species	No impact	No impact MnDOT is coordinating with the USFWS and DNR to assess the potential for impacts to the northern long-eared bat, proposed for listing as an endangered species. Based on current information, the impacts of this alternative are not anticipated to jeopardize the continued existence of the species.	No impact MnDOT is coordinating with the USFWS and DNR to assess the potential for impacts to the northern long-eared bat, proposed for listing as an endangered species. Based on current information, the impacts of this alternative are not anticipated to jeopardize the continued existence of the species.	No impact MnDOT is coordinating with the USFWS and DNR to assess the potential for impacts to the northern long-eared bat, proposed for listing as an endangered species. Based on current information, the impacts of this alternative are not anticipated to jeopardize the continued existence of the species.	No impact MnDOT is coordinating with the USFWS and DNR to assess the potential for impacts to the northern long-eared bat, proposed for listing as an endangered species. Based on current information, the impacts of this alternative are not anticipated to jeopardize the continued existence of the species.
Hazardous Materials and Contaminated Properties	No impact	**Impact:** 17 contamination risk properties within area of evaluation; 2 were evaluated in Phase II assessment; 2 sites recommended for further investigation or consideration **Mitigation**: A Response Action Plan will be prepared prior to right-of-way acquisition for handling of contaminants; standard BMPs for handling taconite-containing materials and spills will be followed	**Impact:** 16 contamination risk properties within area of evaluation; 6 were evaluated in Phase II assessment; 3 sites recommended for further investigation or consideration There are no differences between the Intersection Option and Interchange Option **Mitigation**: A Response Action Plan will be prepared prior to right-of-way acquisition for handling of contaminants; standard BMPs for handling taconite-containing materials and spills will be followed	**Impact:** 16 contamination risk properties within area of evaluation; 6 were evaluated in Phase II assessment; 3 sites recommended for further investigation or consideration There are no differences between the Intersection Option and Interchange Option **Mitigation**: A Response Action Plan will be prepared prior to right-of-way acquisition for handling of contaminants; standard BMPs for handling taconite-containing materials and spills will be followed	**Impact:** 9 contamination risk properties within area of evaluation; 4 were evaluated in Phase II assessment; 2 sites recommended for further investigation or consideration There are no differences between the Straight and Curved Setback Options or the Intersection and Interchange Options **Mitigation**: A Response Action Plan will be prepared prior to right-of-way acquisition for handling of contaminants; standard BMPs for handling taconite-containing materials and spills will be followed

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page 10-2.

Impact		No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Excess Material		No impact	**Impact:**: Net import: 2.8 million cubic yards Export: 80,000 cubic yards Import: 2,900,000 cubic yards **Mitigation**: None proposed	**Impact:** *Intersection Option*: Net import: 1,700,000 cubic yards Export: 3,300,000 cubic yards Import: 5,000,000 cubic yards *Interchange Option*: Net import: 220,000 cubic yards Export: 3,100,000 cubic yards Import: 5,300,000 cubic yards **Mitigation**: Fill placed within the Rouchleau Pit will be reviewed with MPCA and will meet specifications for the source and nature of the fill (i.e., use of clean fill; use of mining by-products only if low in sulfides)	**Impact:** *Intersection Option*: Net export: 480,000 cubic yards Export: 650,000 cubic yards Import: 170,000 cubic yards *Interchange Option*: Net export: 255,000 cubic yards Export: 625,000 cy Import: 370,000 cy **Mitigation**: Fill placed within the Rouchleau Pit will be reviewed with MPCA and will meet specifications for the source and nature of the fill (i.e., use of clean fill; use of mining by-products only if low in sulfides)	**Impact:** <u>Straight Option</u> *Intersection Option*: Net export: 95,000 cubic yards Export: 725,000 cubic yards Import: 630,000 cubic yards *Interchange Option*: Net import: 150,000 cubic yards Export: 700,000 cubic yards Import: 850,000 cubic yards <u>Curved Setback Option</u> *Intersection Option*: Net export: 0 cubic yards Export: 700,000 cubic yards Import: 700,000 cubic yards *Interchange Option*: Net import: 245,000 cubic yards Export: 680,000 cubic yards Import: 925,000 cubic yards **Mitigation**: Fill placed within the Rouchleau Pit will be reviewed with MPCA and will meet specifications for the source and nature of the fill (i.e., use of clean fill; use of mining by-products only if low in sulfides)
Geotechnical and Earthborne Vibration		No impact	**Impact:** Stability and settlement of existing fill material a concern; proximity to mine blasting (located within active mine) **Mitigation**: Special design would be required for slope stability	**Impact:** Stability and settlement of existing submerged haul road a concern; future proximity to mine blasting **Mitigation**: Special design would be required for slope stability	**Impact:** Potential settlement issues; bridge may be susceptible to vibrations from nearby blasting **Mitigation**: Special design would be required for bridge stability	**Impact:** Potential settlement issues; bridge may be susceptible to vibrations from nearby blasting **Mitigation**: Special design would be required for bridge stability
Climate Change		No impact	No impact	No impact	No impact	No impact
Construction Impacts	Visual and Aesthetics	**Impact:** Temporary impacts related to visibility of construction workers and equipment when removing existing US 53 pavement **Mitigation**: None proposed	**Impact:** Temporary impacts related to visibility of construction workers and equipment **Mitigation**: None proposed			
	Economics and Business	**Impact:** Temporary access restrictions during construction **Mitigation**: Manage business impacts during construction	**Impact:** Temporary access restrictions during construction **Mitigation**: Manage business impacts during construction			
	Utilities	**Impact:** Temporary interruptions in service **Mitigation**: Provide notice to utility operators early	**Impact:** Temporary interruptions in service **Mitigation**: Provide notice to utility operators early			
	Wetlands	No impact	No additional impact			

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page 10-2.

Impact		No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
	Noise	**Impact:** Unavoidable noise impacts related to construction equipment **Mitigation**: Standard MnDOT construction noise practices	**Impact:** Unavoidable noise impacts related to construction equipment **Mitigation**: Standard MnDOT construction noise practices			
	Air Quality	**Impact:** Temporary increase in dust/airborne particles; minimal impacts related to emissions from construction equipment **Mitigation:** Standard dust control BMPs such as watering would be implemented	**Impact:** Temporary increase in dust/airborne particles; minimal impacts related to emissions from construction equipment **Mitigation:** Standard dust control BMPs such as watering would be implemented			
	Hazardous and Regulated Materials	No impact	**Impact:** Unidentified contaminants, taconite tailings or other materials may be encountered **Mitigation**: Handling of regulated materials/wastes per management plan, response action plan, demolition plan, and MnDOT Guidance documents			
	Excess Materials	**Impact:** Asphalt/concrete disposal **Mitigation**: Disposal of excess material per approved disposal plan	**Impact:** Import of construction fill and removal of unusable soils **Mitigation**: Disposal of excess material per approved disposal plan			
	Geotechnical and Earthborne Vibrations	No impact	**Impact:** Blasting, pile driving, compacting, and/or pavement breaking or operation of construction equipment may result in temporary earthborn vibrations that could affect homes **Mitigation**: Vibration monitoring would be used. Blasting may be required for each Build Alternative, which could result in some additional temporary road closures similar to those experienced for mine blasting. However, much of the construction for the Build Alternatives is on new alignments and can be constructed with minimal disruption to current US 53 travelers. Blasting, when needed, will be scheduled for minimal disruption.			
	Stormwater	**Impact:** Potential for erosion during existing US 53 roadway removal **Mitigation**: NPDES Stormwater permit for construction activity, including BMPs, temporary construction measures, and erosion control plan, would be acquired and complied with throughout construction. After construction, all disturbed areas would be sodded or seeded.	**Impact:** Potential for erosion during construction **Mitigation**: NPDES Stormwater permit for construction activity, including BMPs, temporary construction measures, and erosion control plan, would be acquired and complied with throughout construction. After construction, all disturbed areas would be sodded or seeded.			
	Water Supply/ Water Body Modification	No impact	**Impact:** Potential for construction dewatering/appropriation for Rouchleau Pit activities for Alternatives E-1A and E-2 **Mitigation**: NPDES Stormwater permit for construction activity, including BMPs, temporary construction measures, and erosion control plan, would be acquired and complied with throughout construction. DNR water appropriation permit may identify mitigation measures. Dewatering discharge options would be considered water transfers to waters of the state and would not be subject to MPCA water quality permitting, provided that there is no intervening use of the water and no pollutants are introduced.			
Short-Term Use and Long-Term Productivity		Substantial long-term transportation inefficiencies	The long-term transportation service and efficiency benefits of the Build and Existing US 53 Alternatives would outweigh short-term adverse impacts to the physical/natural environment. Short-term impacts to the natural environment would be mitigated to alleviate long-term consequences. Would result in the short-term use of resources, but short-term use of these resources is consistent with long-term productivity of the area			
Irreversible and Irretrievable		Increased energy consumption and financial resources for travelers and communities due to increased travel time	One-time expenditure of irretrievable state and federal funds, considered long-term investment; land used for the project is considered an irreversible commitment during the time period that the land is used for a highway facility			
Total Capital Costs for Construction		$1-2 million	$315-450 million	*Intersection Option:* $195-300 million *Interchange Option:* Additional cost of $4 million	*Intersection Option:* $175-270 million *Interchange Option:* Additional cost of $4 million	*Intersection Option (with Straight Option and Curved Setback Option):* $180-240 million *Interchange Option (with Straight Option and Curved Setback Option):* Additional cost of $4 million

10.3 Selection of a Preferred Alternative

Based on the analysis conducted for and presented in this Draft EIS, MnDOT has identified a preferred alternative: Alternative E-2. Each alternative evaluated had unique and challenging issues and a combination of impacts. A description of the rationale used to reach this conclusion is outlined below for each alternative, starting with the preferred alternative.

10.3.1 Preferred Alternative

Alternative E-2 includes a 1,300-foot long bridge with 180-foot or taller bridge piers within the Rouchleau Pit. It is recommended as the preferred alternative based on its ability to meet the project Purpose and Need and minimize impacts to social, economic, and environmental resources, and on the basis of a number of technical and cost considerations, as described below. Both the Straight Option and Curved Setback Option are being carried forward with the preferred alternative for further refinement; however, one will be identified as the selected option in the Final EIS based on public and agency comment, refinement of the design, and overall environmental impacts.

MN 135 and US 53 are currently connected via an interchange. The Highway Safety Manual (HSM) was used to compare crash rates for the Intersection and Interchange Options. The results were essentially the same for the two options at the level of the HSM analysis for the years 2009, 2017, and 2037. Both options have similar levels of service with the exception of the southbound movement in the PM peak hour for the Intersection Option.

While the results were essentially the same between the Intersection Option and Interchange Option at the level of the HSM analysis for the years 2009, 2017, and 2037, this analysis does not account for the grade difference for the east approach between these options. With the Interchange Option, the grade of MN 135 from the east can be reduced from six percent to two percent as compared to the Intersection Option. The Intersection Option would require a much steeper grade (six percent) at the east approach, which would be expected to result in increased difficulty for loaded semi-trucks turning left onto US 53 in the winter (November to April). This difficulty would increase the potential for semi-truck/vehicle conflict at the intersection, which could increase crash risk and result in the intersection being the less desirable option based on safety. This reduction in grade would also reduce the earthwork and rock cut quantities required for construction. Maintenance of existing access and minimizing delays at US 53 and MN 135 has been strongly supported by the public during public meetings. Therefore, the Interchange Option was selected for the preferred alternative over the Intersection Option.

Benefits of the preferred alternative include:

- Mineral Rights: Avoids the permit to mine/environmental setting boundary
- Business Risks: Has no risk for air quality compliance to impact mine operations
- Water Supply: Avoids the major dewatering that would be required for the Alternative E-1 RSS Option
- Wetlands: Both the Straight and Curved Setback Options have fewer wetland impacts than Alternative E-1A (RSS or Bridge Option). The Straight Option has fewer wetland impacts than Alternative M-1, and the Curved Setback Option has wetland impacts similar to Alternative M-1.
- Noise: A noise wall is preliminarily cost effective at affected residential locations
- Right-of-Way: Impacts the fewest number of parcels of any Build Alternative
- Engineering and Constructability Considerations:
    - Shorter bridge than the Alternative E-1A Bridge Option
    - Only two pier foundations required, compared to up to eight for the Alternative E-1A Bridge Option

    - Less work required to construct in the water/ice of the Rouchleau Pit
    - Avoids 40 mph curve needed for Alternative E-1A
    - Has a better sight distance northbound from the bridge to the 2nd Avenue traffic signal than Alternative E-1A
    - Piers to be constructed in less than 30 feet of mine waste fill as compared to Alternative E-1A that would have up to 100 feet of mine waste fill
- Schedule: Has the least schedule risk due to engineering constructability considerations noted above as well as considerations related to owner and operator property interests
- Cost: Costs significantly less than the Existing US 53 Alternative and Alternative M-1, and the upper range of the cost estimate is less than that for either the Alternative E-1A RSS Option or Bridge Option

The negative effects of this alternative include:

- Mineral Rights: More mineral encumbrance than Alternative E-1A; requires greater impact to School Trust land and, therefore, has potential for greater impact to Vermillion Gold, Inc.'s lease than Alternative E-1A
- Section 4(f): Impacts the OHVRA; however, the impact is negligible and meets the definition of de minimis
- Vegetation/Cover Types: Impacts more acres of forest than other alternatives; however, impacts to wildlife are negligible
- Unknowns: Requires additional geotechnical characterization at pier locations

10.3.2 Rationale for Rejecting Other Alternatives

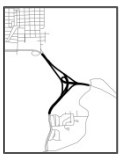
The following describes the factors considered for each of the remaining alternatives and the rationale for why they were not selected for this project.

10.3.2.1 No Build Alternative (Easement Agreement Area Closed)

Similar to the dismissed Alternative W-1A (2013 Amended Scoping Decision Document), the No Build Alternative was not identified as the preferred alternative for several reasons. While it avoids water quality, wetland, mineral resource, and noise impacts associated with the Build Alternatives, it only meets one of the four project needs; therefore, it does not meet the overall need for the project. In addition, it would have substantial economic impacts resulting from increased travel times between the cities of Eveleth, Gilbert, and Virginia; would cause high levels of traffic congestion; and would be expected to result in substantial local and political opposition due to creating greater economic and local impacts than the western alternative (Alternative W-1A) that was dismissed during Scoping. The only benefit of this alternative was that it would avoid crossing the Biwabik Iron Formation, thus keeping mineral rights as a non-issue.

The No Build Alternative was carried forward for analysis as the "do nothing alternative" because it was required for comparison to other alternatives. It is not identified as the preferred alternative since other Build Alternatives (i.e., M-1, E-1A, and E-2) would meet all of the identified project needs with less severe social, economic, and environmental impacts.

10.3.2.2 Existing US 53 Alternative (Easement Agreement Area Remains Open)



Keeping the highway open in its current location would require condemnation by the State of Minnesota to oppose termination of the existing easement agreement knowing that the owner and lessee are not willing sellers. Even with the use of eminent domain, this alternative may require a large payment from the State to the owners and operators of the minerals and mining/lease rights (RGGS and UTAC).

The benefits of this alternative include eliminating the need for new construction or realignment, which would result in no impacts to environmental resources.

The negative effects of this alternative would include:

- Mineral Rights: Uncertainty of ferrous resource quantity and estimated value which has substantial impact on project costs; eminent domain/negotiation process would be required
- Economic: Effect of potential business impacts on local economy
- Schedule: The uncertain effect of the eminent domain process (potential for litigation resulting from eminent domain action) on project schedule
- Cost: The long term effect on state transportation budgets over the next several years due to high cost to acquire mineral rights

Because the Existing US 53 Alternative would have substantially greater cost than any of the Build Alternatives, without addressing schedule and economic impacts, it was not selected as the preferred alternative.

10.3.2.3 Alternative M-1

Alternative M-1 would be routed through the active UTAC mine with approximately one mile of new four-lane roadway constructed to mostly follow the grade created by the partially-backfilled Auburn Pit.

Benefits of this alternative include:

- Access: Shortest alternative with most direct realignment
- Right-of-Way: Requires fewer acres of right-of-way acquisition than the other Build Alternatives
- Mineral Rights: Follows a narrow corridor identified by mine operator as being mostly depleted of ferrous resources
- Section 4(f): Avoids impacts to the OHVRA
- Wetlands: Would have less wetland impact than Alternative E-1A
- Water Supply/Water Quality: Avoids impacts associated with crossing the Rouchleau Pit
- Vegetation/Cover Types: Impacts fewer acres of forest than the other Build Alternatives

The negative effects of this alternative include:

- Mineral Rights: The footprint of the road and setbacks would prohibit mining within a 1,200-foot wide swath through the mine, encumbering more ferrous resources than expected due to mining setbacks
- Business Risk: Greatest business risk impact due to potential conflicts with existing and future mine air quality permit compliance. Mitigation measures to avoid such conflicts were investigated but could not be assured to avoid such risks to the operator. The mitigation cost would be substantial ($65 to 130 million).
- Wetlands: Greater impacts to wetlands than the Alternative E-2 Curved Setback Option

- Noise: A noise wall is preliminarily cost effective at only one of the three affected residential locations
- Engineering and Constructability Considerations:
    - Foundation Concerns: Constructability of RSS fill and/or bridge piers through more than 100 feet of unstable mine waste fill is feasible but at substantial cost to design and construct
    - Constructability: Construction in an active mine (frequent delays while mine blasting) would be costly, especially under an expedited schedule. Contractors would need to be certified/trained to work in the mine.
- Schedule: Construction methods and practices needed to address unstable fill, frequent blasting shutdowns, and road height; it is unlikely this alternative can be constructed in two construction seasons
- Costs: Uncertainty of ferrous resource quantity and estimated value has substantial impact on project costs. MnDOT core samples indicate less ferrous resources here than the existing easement agreement area.

Because Alternative M-1 has feasibility issues and would result in severe negative impacts that are not offset by the benefits in minimization, it was not identified as the preferred alternative.

10.3.2.4 Alternative E-1A

RSS Option

The Alternative E-1A RSS Option is one of the two options considered for Alternative E-1A. Initially, a fill option was thought to provide a less expensive option than building a long bridge. However, as geotechnical issues were investigated, greater risks were identified, increasing the costs for construction.

Benefits of this option include:

- Does not initially require a bridge but may include a future bridge to allow future mine operations to pass under the roadway

The negative effects of this option include:

- Right-of-Way: The required seismic setback is 400 feet greater than the Bridge Option, resulting in the need for more right-of-way and greater impact to future mining operations
- Business Risk: The RSS Option poses moderate business risk compared to low risk from the Alternative E-1A Bridge Option
- Water Supply: Involves potential drawdown of the Rouchleau Pit and Enterprise Pit, with dewatering discharge conveyed to receiving waters outside the project
- Wetlands: The Alternative E-1A RSS and Bridge Options impact the greatest number of wetland acres
- Other Environmental Impacts: Social and physical impacts of this option are similar to that of the Bridge Option except for business risk and dewatering impacts which are greater for the RSS Option
- Engineering and Constructability Considerations: The RSS Option poses a number of risks associated with uncertainty related to geotechnical issues as discussed in Section 5.14.2.4. The embankment would be the highest MnDOT has ever built, approximately 160 feet tall. This embankment would be constructed on top of mine waste fill that is currently under approximately 30 feet of water. The embankment would also be subjected to seismic forces due to future mining operations. Concerns include the stability of the embankment and the potential for settlement. As soil borings and test pits indicate that virtually none of the materials from the planned excavations would meet the graduation requirements of the RSS embankment, the earthwork would involve millions of yards of borrow and excess material.

- Schedule: Requires greatest construction effort while unlikely to meet timeline due to dewatering, with substantial risks for additional delays due to weather, mine waste fill, and design requirements to mitigate constructability concerns.
- Cost: The RSS Option is estimated to cost $20-31 million more than the Bridge Option. The measures required to mitigate the uncertainly are extensive, including time-consuming and costly pumping to lower the water level below the top of the existing fill, removing existing trees and debris, dynamically compacting the surface of the existing fill, constructing a reinforced steepened slope to the desired grade, and instrumenting the embankment to provide warnings in the event the slope moves.

Because the Alternative E-1A RSS Option has feasibility issues and would result in severe schedule and constructability impacts that are not offset by the benefits in minimization of environmental impacts, it was not identified as the preferred alternative.

Bridge Option

This alternative includes a 2,800-foot long bridge with 150-foot or taller bridge piers within the Rouchleau Pit.

Benefits of this alternative include:

- Mineral Rights: Lowest ferrous and non-ferrous resource encumbrance expected of all alternatives
- Schedule: Major dewatering not required, unlike for the RSS Option
- Cost: The Bridge Option would cost less than the RSS Option but potentially more than Alternative E-2

The negative effects of this alternative include:

- Right-of-Way: Impacts the most parcels of any of the Build Alternatives
- Business Risk: The Bridge Option poses moderate business risk compared to low risk from Alternative E-2
- Section 4(f): Impacts the OHVRA; however, the impact is negligible and meets the definition of de minimis
- Wetlands: The Alternative E-1A RSS and Bridge Options impact the greatest number of wetland acres
- Noise: A noise wall is preliminarily cost effective at only one of the three affected residential locations
- Vegetation/Cover Types: Impacts more acres of forest than Alternative M-1; however, impacts to wildlife are negligible
- Environmental Impacts: Social and physical impacts of this option are similar to that of the RSS Option except for business risk and dewatering impacts which are greater for the RSS Option.
- Constructability: This option requires the longest bridge of any of the Build Alternatives. It poses a number of risks associated with uncertainty related to geotechnical issues as discussed in Section 5.14.2.4. The bridge would be one of the highest MnDOT has ever built, up to 200 feet tall. Bridge piers would be constructed on top of mine waste fill that is 30 to 100 feet thick and is currently under approximately 30 feet of water. The bridge would also be subjected to seismic forces due to future mining operations. Concerns include the stability of the bridge piers and the potential for settlement.
- Schedule: Requires greatest construction effort to meet timeline, with substantial risks for delays due to weather, mine waste fill, and design requirements to mitigate constructability concerns.

Because the Alternative E-1A Bridge Option has feasibility issues and would result in severe negative schedule impacts that are not offset by the benefits in minimization of environmental impacts, it was not identified as the preferred alternative.

10.3.3 EIS Review Process and Schedule

As required by the federal and state environmental review process, copies of the Draft EIS will be distributed to appropriate local, regional, state, and federal agencies as well as the public for their review and comment. Public comment on the content of the Draft EIS and the identified preferred alternative will be taken into account in the preparation of the Final EIS and Record of Decision (ROD).

The anticipated schedule for this process is as follows (subject to revision):

- Draft EIS published with a 45-day comment period – December 2014
- Final EIS and Record of Decision – fall 2015